Trend Study 16A-18-02

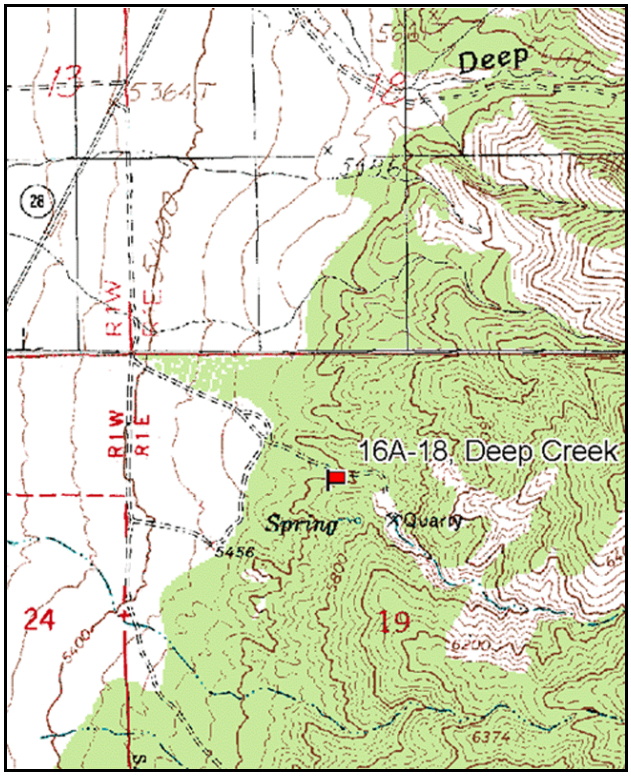
Study site name: Deep Creek. Vegetation type: True Mountain Mahogany.

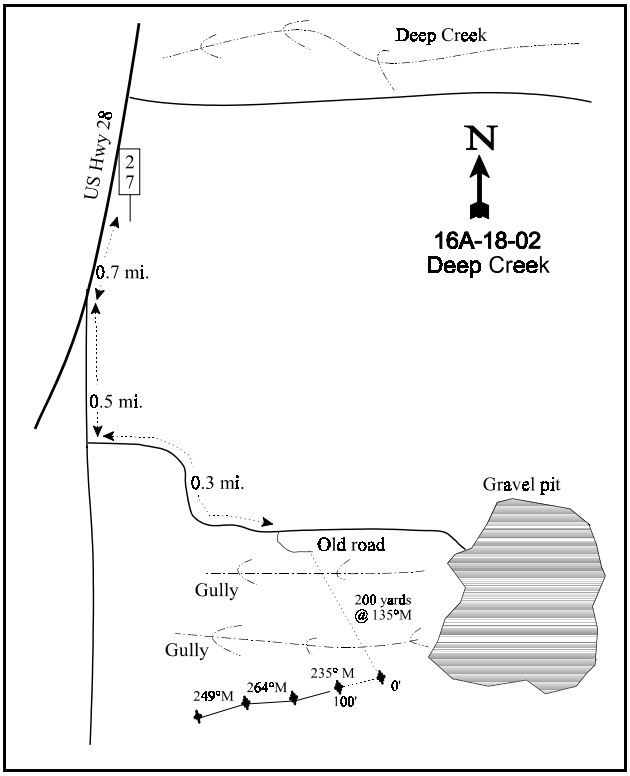
Compass bearing: frequency baseline 235 degrees magnetic (line 3 @ 264°M, line 4 @ 249°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the post office in Levan go south on U-28 for 3.8 miles. Turn left 0.7 miles past mile marker 27 (east then south) and go 0.5 miles to a fork in the road. Take a left (east) and go 0.3 miles to another fork. Take the old road to the right and park when it ends. From here, the 0-foot baseline stake is 200 yards at an azimuth of 135 degrees magnetic. There are some large boulders around the 100-foot baseline stake.




Map Name: Chriss Canyon

Diagrammatic Sketch

Township 15S, Range 1E, Section 19

GPS: NAD 27, UTM 12S 4371983 N 425754 E

## DISCUSSION

### Deep Creek - Trend Study No. 16A-18

This trend study monitors critical deer winter range located just south of Deep Creek. It is placed along a narrow ridge running east to west, sampling northwest and southeast facing slopes of 15% to 20%. The site supports a sparse pinyon-juniper stand associated with an understory mixture of browse species. Vegetative composition is typical of the west facing foothills from Levan south to the unit boundary. Herbaceous plants are usually very scattered and of little importance. Deer use of the area was reported moderate to heavy in 1983 and 1989. Several deer carcasses were found on the site in 1989. Pellet group quadrat frequency for deer was fairly low at 16% in 1997. A few elk pellet groups were also found at that time. Data from a pellet group transect read on site in 2002 estimated only 9 deer days use/acre (23 ddu/ha). Sheep had heavily utilized the site during the spring of 2002.

Soils are moderately deep in places with an average effective rooting depth of just over 18 inches along the baseline. Texture is a clay with a neutral pH of 7.2. The soil has poor structure with considerable erosion pavement on the surface. Pavement consists of small, flat and thin rock that cover a large portion of the exposed bare areas. Phosphorus is low at only 6.6 ppm. Values less than 10 ppm may be limiting to plant growth and development. In addition, percent organic matter is relatively low at only 1.2%. Permeability to water is likely poor and even moderate intensity storms can generate runoff from the barren shrub and tree interspaces. Erosion is apparent and unavoidable due to the poor protective ground cover. Protective cover is principally a function of aerial shrub and tree crowns, not herbaceous cover which is more effective at protecting the soil. With the lack of herbaceous species, the protection of the surface soil is minimal. Bare ground has been high in all years, especially in 2002 at 47%. The erosion condition classification was determined to be slight in 2002.

The site supports small populations of three preferred browse species: mountain big sagebrush, true mountain mahogany, and green ephedra. Mountain big sagebrush numbered around 500 plants/acre in 1983 and 1989. The population has become increasingly decadent with heavy use through 1989. Since 1989, sagebrush numbers have steadily declined to only 240 moderately hedged plants/acre in 2002. Vigor is normal on most plants but half are decadent. Dead plants, first included in the 1997 sample, total more than the number of live plants (360 plants/acre), indicating a definite declining population. Recruitment is also poor with no young or seedlings sampled in 2002.

True mountain mahogany appeared to have a stable population with adequate reproduction, moderate to heavy use, and low decadence in 1983 and 1989. Mahogany density increased by 46% in 1997 likely due to the larger, more representative sample used. Density was estimated at 1,040 plants/acre in 2002. Use remains moderate to heavy with most use in 2002 due to spring sheep grazing. Annual leader growth averaged 2.5 inches in 2002 and leaders were difficult to find due to the heavy use on available plants. Decadence increased from 14% in 1997 to 35% in 2002.

Although green ephedra is less preferred, it produces additional winter forage. The population density was estimated at 700 plants/acre in 2002. Mature plants are large with an average height of 3 ½ feet and a crown diameter of over 4 feet. Use of these shrubs was light to moderate in 1997 and 2002.

The herbaceous understory is sparsely distributed and most shrub and tree interspaces lack vegetative cover. Even cheatgrass is infrequent and found mostly under juniper crowns. Perennial grasses occur most often in the more favorable microsites near the base of shrubs. The most common perennial species is bluebunch wheatgrass which grows in scattered patches. The only other fairly common perennial grass is Sandberg bluegrass. Forbs produce as much cover as grasses, but composition is poor. The most common species is the annual, bur buttercup. The only common perennial species include tapertip hawksbeard and hoods phlox.

1983 APPARENT TREND ASSESSMENT

Soil condition is poor with poor protective ground cover provided by herbaceous plants. The study area has poor fertility and has a long history of erosion which has depleted the site potential. Soil erosion will continue to be a problem unless some manipulative steps such as terracing or chaining and seeding are undertaken. Vegetative trend appears somewhat more stable, in spite of an apparent declining big sagebrush population. The other key species, true mountain mahogany, appears stable or perhaps even increasing. Herbaceous understory is depleted and will continue to be so.

1989 TREND ASSESSMENT

Soil trend is down slightly due to a significant increase in cover of pavement and a decline in litter cover. Percent bare ground declined, but it is apparent that the decline is the result of soil loss. Erosion is ongoing and there are active gullies around the site. Comparisons of the browse data indicate a stable browse component. The key browse species, namely true mountain mahogany and mountain big sagebrush, have maintained their moderate to heavily hedged growth form and normal vigor. About a third of the mahogany population consists of young plants. The sagebrush population is stable in terms of density, but percent decadence has increased. Trend for the herbaceous understory is up slightly. The frequency data show a significant increase in the nested frequency of bluebunch wheatgrass. In the forb category, frequency is moderate and composition is similar between years for this relatively unimportant forage source.

TREND ASSESSMENT
soil - down slightly and in poor condition (2)
browse - stable (3)
herbaceous understory - up slightly, but poor (4)

1997 TREND ASSESSMENT

The soil trend shows an increasing loss of soil with rock/pavement cover increasing from 26% to 29% and bare ground declining from 31% to 25%. Litter cover is low and has declined to 26%. Trend is considered stable but in very poor condition. The browse trend appears stable. Density of mountain big sagebrush has declined, but it is not known how much of the change is due to the larger sample taken in 1997. However, the large number of dead plants alone (340 plants/acre) can explain the decline in the population. The most important browse species, mountain mahogany, accounts for 38% of the browse cover. It displays a stable population with moderate to heavy use, good vigor, and low decadence. The increase in density between 1989 and 1997 is likely due to the larger sample used in 1997. Trend for the herbaceous understory is stable and in poor condition.

TREND ASSESSMENT
soil - Stable but in poor condition (3)
browse - stable (3)
herbaceous understory - stable but poor (3)

2002 TREND ASSESSMENT

Trend for soil is down and in poor condition. Cover of bare ground has increased from 25% to 47%. Grass and forb cover have also declined from 17% to 7%. Cover of pavement declined nearly 2-fold. Some of the increase in bare ground and decline in pavement cover is likely due to the large number of sheep which grazed the site this spring. However, erosion is ongoing and there is not enough protective ground cover on the soil surface. Trend for the key browse species, mountain mahogany, is up slightly. Density has increased 17% to 1,040 plants/acre, cover has increased slightly, and strip frequency has increased to 29%. Use remains moderate to heavy and vigor is normal on most plants. However, the number of decadent plants has doubled to 35% of the population. Recruitment is marginal but should rebound with a return to normal precipitation. Secondary browse species, mountain big sagebrush and green ephedra, both show similar levels of use compared to 1997, but decadence has also increased. The browse component has a stable trend overall. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses has remained stable but frequency of perennial forbs has declined. Total herbaceous cover has also declined from 17% in 1997 to only 7% in 2002. Grasses and forbs remain unevenly distributed and composition is poor.

TREND ASSESSMENT
soil - down (1)
browse - stable (3)
herbaceous understory - down slightly and poor (2)

HERBACEOUS TRENDS --
Herd unit 16A, Study no: 18

| Type | Species | Nested Frequency | | | | Quadrat Frequency | | | | Average Cover % | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | '83 | '89 | '97 | '02 | '83 | '89 | '97 | '02 | '97 | '02 |
| G | Agropyron spicatum | a79 | b141 | b127 | b120 | 33 | 59 | 50 | 51 | 6.26 | 3.11 |
| G | Bromus tectorum (a) | - | - | b105 | a33 | - | - | 36 | 12 | 1.05 | .28 |
| G | Oryzopsis hymenoides | 2 | - | - | - | 1 | - | - | - | - | - |
| G | Poa fendleriana | - | 2 | - | - | - | 1 | - | - | - | - |
| G | Poa secunda | a25 | ab31 | bc62 | c66 | 11 | 15 | 25 | 26 | 1.37 | .33 |
| Total for Annual Grasses | | 0 | 0 | 105 | 33 | 0 | 0 | 36 | 12 | 1.05 | 0.28 |
| Total for Perennial Grasses | | 106 | 174 | 189 | 186 | 45 | 75 | 75 | 77 | 7.64 | 3.44 |
| Total for Grasses | | 106 | 174 | 294 | 219 | 45 | 75 | 111 | 89 | 8.69 | 3.72 |
| F | Agoseris glauca | - | - | - | 4 | - | - | - | 2 | - | .01 |
| F | Alyssum alyssoides (a) | - | - | 5 | - | - | - | 2 | - | .01 | - |
| F | Arabis spp. | 1 | - | 5 | 6 | 1 | - | 2 | 5 | .01 | .02 |
| F | Astragalus spp. | - | - | - | 1 | - | - | - | 1 | - | .00 |
| F | Calochortus nuttallii | 9 | 3 | 10 | 7 | 4 | 1 | 4 | 5 | .02 | .02 |
| F | Chaenactis douglasii | 3 | - | - | 2 | 1 | - | - | 1 | - | .00 |
| F | Collinsia parviflora (a) | - | - | 4 | 1 | - | - | 1 | 1 | .00 | .00 |
| F | Crepis acuminata | a14 | a17 | b53 | a16 | 6 | 9 | 20 | 7 | 2.03 | .08 |
| F | Cruciferae | a- | a- | b43 | a- | - | - | 15 | - | .12 | - |
| F | Cryptantha spp. | b78 | a30 | a27 | a11 | 37 | 17 | 14 | 5 | .12 | .02 |
| F | Descurainia pinnata (a) | - | - | 18 | 12 | - | - | 7 | 4 | .03 | .02 |
| F | Eriogonum brevicaule | 3 | 7 | 7 | 7 | 1 | 3 | 3 | 3 | .01 | .04 |

| Type | Species | Nested Frequency | | | | Quadrat Frequency | | | | Average Cover % | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | '83 | '89 | '97 | '02 | '83 | '89 | '97 | '02 | '97 | '02 |
| F | Erigeron spp. | $_{b}$19 | $_{a}$3 | $_{a}$2 | $_{a}$- | 6 | 1 | 1 | - | .00 | - |
| F | Galium aparine (a) | - | - | 16 | 5 | - | - | 6 | 2 | .20 | .01 |
| F | Gilia spp. (a) | - | - | $_{a}$12 | $_{b}$29 | - | - | 4 | 10 | .02 | .05 |
| F | Haplopappus acaulis | - | - | 4 | - | - | - | 1 | - | .15 | - |
| F | Hackelia patens | $_{ab}$5 | $_{b}$9 | $_{a}$- | $_{b}$10 | 3 | 5 | - | 6 | - | .03 |
| F | Lactuca serriola | - | - | - | 2 | - | - | - | 1 | - | .00 |
| F | Leucelene ericoides | $_{a}$- | $_{a}$- | $_{c}$16 | $_{b}$11 | - | - | 5 | 4 | .24 | .04 |
| F | Machaeranthera canescens | - | 1 | - | - | - | 1 | - | - | - | - |
| F | Penstemon spp. | - | - | 6 | - | - | - | 2 | - | .01 | - |
| F | Physaria australis | 4 | - | - | - | 2 | - | - | - | - | - |
| F | Physalis hederaefolia | - | - | 1 | - | - | - | 1 | - | .00 | - |
| F | Phlox hoodii | $_{a}$112 | $_{b}$155 | $_{a}$89 | $_{a}$102 | 47 | 60 | 38 | 42 | 1.88 | 2.34 |
| F | Phlox longifolia | $_{a}$26 | $_{ab}$30 | $_{b}$56 | $_{ab}$40 | 11 | 14 | 25 | 18 | .20 | .09 |
| F | Ranunculus testiculatus (a) | - | - | $_{b}$275 | $_{a}$139 | - | - | 82 | 48 | 3.50 | .85 |
| F | Stanleya pinnata | $_{ab}$7 | $_{b}$17 | $_{a}$- | $_{a}$- | 3 | 6 | - | - | - | - |
| F | Unknown forb-annual (a) | - | - | 8 | - | - | - | 5 | - | .10 | - |
| F | Zigadenus paniculatus | - | 1 | 1 | - | - | 1 | 1 | - | .00 | - |
| Total for Annual Forbs | | 0 | 0 | 338 | 186 | 0 | 0 | 107 | 65 | 3.87 | 0.93 |
| Total for Perennial Forbs | | 281 | 273 | 320 | 219 | 122 | 118 | 132 | 100 | 4.82 | 2.73 |
| Total for Forbs | | 281 | 273 | 658 | 405 | 122 | 118 | 239 | 165 | 8.70 | 3.67 |

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 16A, Study no: 18

| Type | Species | Strip Frequency | | Average Cover % | |
|---|---|---|---|---|---|
| | | '97 | '02 | '97 | '02 |
| B | Artemisia tridentata vaseyana | 13 | 10 | .74 | 1.02 |
| B | Cercocarpus montanus | 26 | 29 | 4.73 | 5.89 |
| B | Chrysothamnus viscidiflorus stenophyllus | 5 | 8 | .36 | .21 |
| B | Ephedra viridis | 18 | 20 | 2.62 | 3.43 |
| B | Juniperus osteosperma | 3 | 2 | 3.95 | 2.48 |
| B | Pinus edulis | 0 | 2 | - | .66 |
| B | Quercus gambelii | 0 | 0 | - | .00 |
| Total for Browse | | 65 | 71 | 12.42 | 13.70 |

CANOPY COVER --
Herd unit 16A , Study no: 18

Point-Quarter Tree Data

| Species | Percent Cover | | Trees per Acre | | Average diameter (in) | |
|---|---|---|---|---|---|---|
| | '97 | '02 | '97 | '02 | '97 | '02 |
| Juniperus osteosperma | 6.4 | 3 | 52 | 63 | 10.6 | 11.0 |
| Pinus edulis | - | .40 | - | - | - | - |

Key Browse Annual Leader Growth
Herd unit 16A , Study no: 18

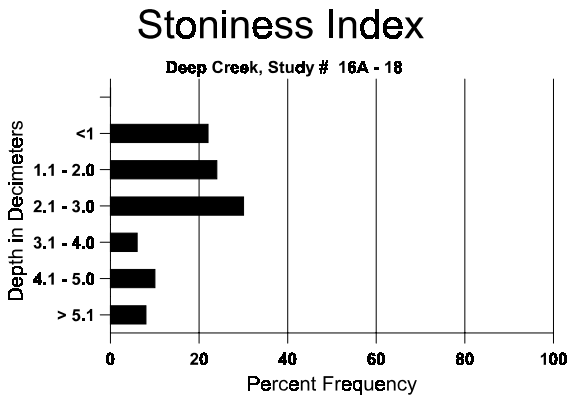
| Species | Average leader growth (in) |
|---|---|
| | '02 |
| Cercocarpus montanus | 2.5 |

BASIC COVER --
Herd unit 16A, Study no: 18

| Cover Type | Nested Frequency | | Average Cover % | | | |
|---|---|---|---|---|---|---|
| | '97 | '02 | '83 | '89 | '97 | '02 |
| Vegetation | 358 | 270 | 2.50 | 9.75 | 27.87 | 23.49 |
| Rock | 211 | 240 | 2.25 | 5.25 | 8.19 | 7.31 |
| Pavement | 312 | 323 | 6.75 | 20.50 | 20.05 | 10.19 |
| Litter | 382 | 359 | 46.50 | 33.75 | 25.98 | 27.82 |
| Cryptogams | 35 | 30 | 2.00 | 0 | .67 | .88 |
| Bare Ground | 286 | 326 | 40.00 | 30.75 | 25.02 | 47.01 |

SOIL ANALYSIS DATA --
Herd Unit 16A, Study no: 18, Deep Creek

| Effective rooting depth (in) | Temp °F (depth) | pH | %sand | %silt | %clay | %0M | PPM P | PPM K | dS/m |
|---|---|---|---|---|---|---|---|---|---|
| 18.3 | 49.0 (17.0) | 7.2 | 28.7 | 19.4 | 51.8 | 1.2 | 6.6 | 124.8 | .4 |



PELLET GROUP FREQUENCY --
Herd unit 16A, Study no: 18

| Type | Quadrat Frequency | | Pellet Transect | |
|---|---|---|---|---|
| | | | Pellet Groups per Acre | Days Use per Acre (ha) |
| | '97 | '02 | '02 | '02 |
| Sheep | - | 12 | 722 | 56 (137) |
| Rabbit | 9 | 15 | - | - |
| Elk | 2 | 1 | - | - |
| Deer | 16 | 1 | 122 | 9 (23) |

BROWSE CHARACTERISTICS --
Herd unit 16A, Study no: 18

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Artemisia tridentata vaseyana | | | | | | | | | | | | | | | | | | |
| Y | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| M | 83 | 2 | 6 | 1 | - | - | - | - | - | - | 9 | - | - | - | 300 | 28 | 34 | 9 |
| | 89 | - | 3 | 2 | - | - | - | 1 | - | - | 6 | - | - | - | 200 | 21 | 19 | 6 |
| | 97 | 8 | 1 | - | - | - | - | - | - | - | 9 | - | - | - | 180 | 26 | 30 | 9 |
| | 02 | 3 | 3 | - | - | - | - | - | - | - | 6 | - | - | - | 120 | 24 | 25 | 6 |
| D | 83 | - | 2 | 5 | - | - | - | - | - | - | 7 | - | - | - | 233 | | | 7 |
| | 89 | - | 4 | 4 | - | - | - | 1 | - | - | 4 | - | - | 5 | 300 | | | 9 |
| | 97 | 4 | 1 | - | - | - | - | - | - | - | 3 | - | - | 2 | 100 | | | 5 |
| | 02 | 2 | 4 | - | - | - | - | - | - | - | 5 | - | 1 | - | 120 | | | 6 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 340 | | | 17 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 360 | | | 18 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 50% | 38% | 00% | |
| '89 | 47% | 40% | 33% | - 6% |
| '97 | 13% | 00% | 13% | -40% |
| '02 | 58% | 00% | 08% | -20% |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '83 | 533 | Dec: | | 44% |
| '89 | 500 | | | 60% |
| '97 | 300 | | | 33% |
| '02 | 240 | | | 50% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cercocarpus montanus | | | | | | | | | | | | | | | | | | |
| Y | 83 | - | 4 | - | - | - | - | - | - | - | 4 | - | - | - | 133 | | | 4 |
| | 89 | - | 4 | - | - | - | - | - | - | - | 4 | - | - | - | 133 | | | 4 |
| | 97 | 1 | 5 | - | - | - | - | - | - | - | 6 | - | - | - | 120 | | | 6 |
| | 02 | 1 | - | - | - | 1 | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| M | 83 | 1 | 6 | 2 | - | - | - | - | - | - | 9 | - | - | - | 300 | 35 | 36 | 9 |
| | 89 | - | 3 | - | - | 4 | 1 | - | - | - | 8 | - | - | - | 266 | 40 | 41 | 8 |
| | 97 | - | 17 | 14 | - | - | - | - | - | - | 31 | - | - | - | 620 | 39 | 48 | 31 |
| | 02 | 10 | 8 | 6 | - | 5 | - | 3 | - | - | 32 | - | - | - | 640 | 42 | 50 | 32 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | 2 | - | - | - | - | - | - | - | - | - | 2 | 66 | | | 2 |
| | 97 | - | 5 | 1 | - | - | - | - | - | - | 5 | - | - | 1 | 120 | | | 6 |
| | 02 | 2 | 7 | 7 | - | 1 | 1 | - | - | - | 13 | - | - | 5 | 360 | | | 18 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | | | 1 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 77% | 15% | 00% | + 7% |
| '89 | 79% | 21% | 14% | +46% |
| '97 | 63% | 35% | 02% | +17% |
| '02 | 42% | 27% | 10% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '83 | 433 | Dec: | | 0% |
| '89 | 465 | | | 14% |
| '97 | 860 | | | 14% |
| '02 | 1040 | | | 35% |

| Chrysothamnus viscidiflorus stenophyllus | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 83 | 3 | - | - | - | - | - | - | - | - | 3 | - | - | - | 100 | 11 | 14 | 3 |
| | 89 | 3 | 1 | - | - | - | - | - | - | - | 4 | - | - | - | 133 | 10 | 13 | 4 |
| | 97 | 4 | - | - | - | - | - | - | - | - | 4 | - | - | - | 80 | 10 | 16 | 4 |
| | 02 | 5 | 1 | 1 | - | - | - | - | - | - | 7 | - | - | - | 140 | 10 | 20 | 7 |
| D | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 20 | | | 1 |
| | 02 | - | 1 | 1 | 1 | - | - | - | - | - | 3 | - | - | - | 60 | | | 3 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | +25% |
| '89 | 25% | 00% | 00% | -25% |
| '97 | 00% | 00% | 00% | +50% |
| '02 | 20% | 20% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | |
|---|---|---|---|
| '83 | 100 | Dec: | 0% |
| '89 | 133 | | 0% |
| '97 | 100 | | 20% |
| '02 | 200 | | 30% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cowania mexicana stansburiana | | | | | | | | | | | | | | | | | | |
| M | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 89 | - | 2 | - | - | - | - | - | - | - | 2 | - | - | - | 66 | 26 | 35 | 2 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 18 | 18 | 0 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | |
| '89 | 100% | 00% | 00% | |
| '97 | 00% | 00% | 00% | |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | Dec: | |
|---|---|---|---|---|
| | '83 | 0 | | - |
| | '89 | 66 | | - |
| | '97 | 0 | | - |
| | '02 | 0 | | - |

| Ephedra viridis | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | 83 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 33 | | | 1 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | 2 | - | - | - | - | - | - | - | - | 2 | - | - | - | 40 | | | 2 |
| M | 83 | 6 | - | - | - | - | - | - | - | - | 6 | - | - | - | 200 | 40 | 48 | 6 |
| | 89 | 4 | - | - | - | - | - | - | - | - | 4 | - | - | - | 133 | 35 | 24 | 4 |
| | 97 | 14 | 3 | - | - | 2 | - | - | - | - | 18 | - | 1 | - | 380 | 41 | 56 | 19 |
| | 02 | 18 | 4 | - | 1 | - | - | - | - | - | 23 | - | - | - | 460 | 42 | 53 | 23 |
| D | 83 | 1 | 1 | - | - | - | - | - | - | - | 2 | - | - | - | 66 | | | 2 |
| | 89 | 6 | - | - | - | - | - | - | - | - | 6 | - | - | - | 200 | | | 6 |
| | 97 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | - | - | 60 | | | 3 |
| | 02 | 7 | - | - | - | 1 | - | 2 | - | - | 8 | - | - | 2 | 200 | | | 10 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 120 | | | 6 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 11% | 00% | 00% | +10% |
| '89 | 00% | 00% | 00% | +24% |
| '97 | 27% | 00% | 05% | +37% |
| '02 | 14% | 00% | 06% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | Dec: | |
|---|---|---|---|---|
| | '83 | 299 | | 22% |
| | '89 | 333 | | 60% |
| | '97 | 440 | | 14% |
| | '02 | 700 | | 29% |

| AGE | YR | Form Class (No. of Plants) 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Vigor Class 1 | 2 | 3 | 4 | Plants Per Acre | Average (inches) Ht. | Cr. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Juniperus osteosperma | | | | | | | | | | | | | | | | | | |
| M | 83 | - | - | - | - | - | - | - | 2 | - | 2 | - | - | - | 66 | 67 | 207 | 2 |
| | 89 | - | - | - | - | - | - | - | 2 | - | 2 | - | - | - | 66 | 165 | 136 | 2 |
| | 97 | 1 | - | - | - | - | - | 1 | - | 1 | 3 | - | - | - | 60 | - | - | 3 |
| | 02 | 3 | - | - | - | - | - | - | - | - | 3 | - | - | - | 60 | - | - | 3 |
| X | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | | | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 40 | | | 2 |
| | 02 | - | - | - | - | - | - | - | - | - | - | - | - | - | 40 | | | 2 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | + 0% |
| '89 | 00% | 00% | 00% | - 9% |
| '97 | 00% | 33% | 00% | + 0% |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | | |
|---|---|---|---|---|
| '83 | 66 | Dec: | | - |
| '89 | 66 | | | - |
| '97 | 60 | | | - |
| '02 | 60 | | | - |

| Pinus edulis | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - | 0 |
| | 02 | 1 | - | - | 1 | - | - | - | - | - | 2 | - | - | - | 40 | - | - | 2 |

| % Plants Showing | Moderate Use | Heavy Use | Poor Vigor | %Change |
|---|---|---|---|---|
| '83 | 00% | 00% | 00% | |
| '89 | 00% | 00% | 00% | |
| '97 | 00% | 00% | 00% | |
| '02 | 00% | 00% | 00% | |

| Total Plants/Acre (excluding Dead & Seedlings) | | | |
|---|---|---|---|
| '83 | 0 | Dec: | - |
| '89 | 0 | | - |
| '97 | 0 | | - |
| '02 | 40 | | - |